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EXAMINER	
LEE, JOHN W	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/800,420	Applicant(s) KRAFT, RAYMOND H.	
	Examiner JOHN LEE	Art Unit 2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 March 2012*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-40* is/are pending in the application.

5a) Of the above claim(s) *8-15 and 21-28* is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-7, 16-20 and 29-40* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment/Arguments

1. Applicant's amendment and arguments filed on 14 March 2012 have been fully considered.

2. Summary of applicant's remarks

1) Status of the claims:

- Claims 1-7, 16-20 and 29-40 remain pending
- Claims 1-2, 16, 29 and 37 are amended
- Claims 8-15 and 21-28 are canceled
- Claim 40 is added.

2) Ground of rejections to be reviewed based on applicant's remarks:

- Rejection of claims 1-7, 16-20 and 29-39 under 35 U.S.C. 103(a)

3. Response to Applicant's remarks

1) Rejection of claims 1-7, 16-20 and 29-39 under 35 U.S.C. § 103(a):

Applicant's arguments with respect to claims 1-7, 16-20 and 29-39 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

> art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-7, 16-20 and 29-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is unclear where in the specification supports the new amended claim limitation. The applicant point out which part of the specification supports the amended claim limitation or amend the claim limitations to be supported by the specification.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-2, 4-6, 16-17, 19-20, 29-30 and 32-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macy et al. (US 6,538, 691) in view of Michael et al. (US 5,768,443), and further in view of Nonay et al. (US 6,618,494).

a. Regarding claim 1, Macy discloses a method of fitting acquired fiducial data to a set of fiducials on a fiducial plate said method comprising:

translating an imaging apparatus across a plane parallel to the fiducial plate to capture image data such that image features of the image data is captured at discrete locations and positioned in space relative to the fiducial plate ("images are captured on a digital camera, they may be distorted … optical axis of camera … point Pd … point Po…" at col. 2, lines 21-64).

However, Macy does not disclose fitting a fiducial grid model to the image data acquired by the imaging apparatus for each discrete location to identify image feature centers;

establishing a conversion from coordinates obtained from the image data to ideal fiducial coordinates using a data processing component based on fitting the fiduciai grid model for each discrete location;

calculating an absolute location for each identified acquired image feature centers relative to the fiducial plate in fiducial plate coordinates based on the conversion using the data processing component, the absolute location indicating a distance ' measurement in fiducial plate coordinates; and

based on at least one calculated absolute location of the identified acquired image feature centers, selectively modifying a structure represented by the identified acquired image feature center.

Instead of Macy, Michael discloses establishing a conversion from coordinates obtained from the image data to ideal fiducial coordinates using a data processing component (FIG. 6-48, "estimate camera distortion correction for each camera"; equations (1)-(5) and (13)-(39); "The inventor discloses fitting (computing) a function-

$x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij} u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij} u^i v^i$, to a set of data for the correction map." at col. 7, line 40 to col. 8, line 25 and col. 12, lines 22 to col. 15, line 40);

calculating an absolute location for each identified acquired image feature centers ("pixels associated with feature points" at col. 16, lines 57-58) relative to the fiducial plate in fiducial plate coordinates based on the coversion (FIG. 9-56, "The inventor discloses that all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map. The distortion correction map has a fitting function, $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij} u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij} u^i v^i$ that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point or a pixel in one coordinate to the other one. Moreover, it well known that a coordinate or a coordinate system does tell the location of a pixel or a point from the center of the coordinate or coordinate system." at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58) using the data processing component (The MPEP teaches that [t]he express, implicit, and ***inherent*** disclosures of a prior art reference may be relied upon in ***the rejection of claims under 35 U.S.C. 102*** or 103[1] [emphasis added]. So, "it is inherent that some sort of data processing component will be used for the camera corrected distortion using a distortion correction map because it uses coordinates of a pixel" at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58) the absolute location indicating a

distance measurement in fiducial plate coordinates ("It well known that a coordinate or a coordinate system does indicate the location of a pixel or a point from the center of the coordinate or coordinate system, which is an indication of the distance from the center" at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58); and

based on at least one calculated absolute location of the identified acquired image feature centers (col. 16, lines 57-58, "pixels associated with feature points"), selectively modifying a structure represented by the identified acquired image feature center ("It is disclosed that only pixels associated with feature points of interest are corrected" at col. 16, lines 57-58);

Nonay discloses fitting a fiducial grid model to the image data acquired by the imaging apparatus for each discrete location to identify image feature centers (Fig. 1-405 and Fig. 13; "the determined grid points are preferably fitted to polynomials providing the best fit …" at col. 16, lines 44-64).

Macy, Michael and Nonay are combinable because both are related to the field of point transformation.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add the process of "fitting grid points" of Nonay and Michael's "method of image distortion correction and local-to-global coordinate transformation using pixel and landmark" to Macy's apparatus for correcting geometrical distortions in digital images using a camera.

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[1] See MPEP § 2112

The suggestion/motivation would have been to “remove optical distortion from digital image … [and] quickly and efficiently correct optical distortion” (Nonay; col. 2, lines 51-58).

b. Regarding claim 2, Michael further discloses wherein said fitting (FIG. 6-48, “estimate camera distortion correction for each camera”; equations (1)-(5) and (13)-(39); “The inventor discloses fitting (computing) a function- $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij}u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij}u^i v^i$, to a set of data for the correction map.” at col. 7, line 40 to col. 8, line 25 and col. 12, lines 22 to col. 15, line 40) comprises identifying fiducial coordinates for each fiducial captured in said image data (“[T]he landmark feature of the calibration target is used to establish a local origin for the corrected physical coordinate system” at col. 7, lines 14-16) acquired by said imaging apparatus (FIG. 1-18, 20 or 22; col. 7, lines 41, “particular camera”).

c. Regarding claim 4, Michael further discloses wherein said calculating (FIG. 9-56, “The inventor discloses that all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map. The distortion correction map has a fitting function, $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij}u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij}u^i v^i$ that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point or a pixel in one coordinate to the

other one. Moreover, it well known that a coordinate or a coordinate system does tell the location of a pixel or a point from the center of the coordinate or coordinate system." at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58) comprises utilizing a linear least squares operation (equations (18)-(22); "Singular Value Decomposition technique to solve least-squares problems … Ax=b" at col. 12, line 61 to col. 13, line 27).

d. Regarding claim 5, Nonay further discloses further comprising assuming that a rotation of said imaging apparatus relative to a fiducial grid is negligible (Fig. 1-405 and Fig. 13; "The determined grid points are preferably fitted to polynomials providing the best fit, which shows that the rotation of an imaging apparatus was not considered" at col. 16, lines 44-64).

e. Regarding claim 6, Michael further discloses wherein said imaging apparatus comprising a charge- coupled device camera ("image device [] such as a CCD (charge coupled device)" at col. 6, lines 40-41).

f. Regarding claim 16, claim 16 recites a computer readable medium encoded with data and instructions, said data and said instruction causing an apparatus executing said instructions comprising steps equivalent to claims 1.

See rejection of claim 1 for further explanation.

g. Regarding claim 17, Claims 17 recites a computer readable medium encoded with data and instructions, said data and said instruction causing an apparatus executing said instructions comprising steps equivalent to claims 2.

The claim is analogous and corresponds to claim 2. See rejection of claim 2 for further explanation.

h. Regarding claim 19, Claims 19 recites a computer readable medium encoded with data and instructions, said data and said instruction causing an apparatus executing said instructions comprising steps equivalent to claims 4.

The claim is analogous and corresponds to claim 4. See rejection of claim 4 for further explanation.

i. Regarding claim 20, claim 20 is analogous and corresponds to claim 5. See rejection of claim 5 for further explanation.

j. Regarding claim 29, Macy discloses a method of accurately identifying a location of a feature relative to a fiducial plate comprising:

acquiring an image of an object with an imaging apparatus by translating the imaging apparatus across a plane parallel to a fiducial plate to capture the image data at discrete locations ("images are captured on a digital camera, they may be distorted … optical axis of camera … point Pd … point Po…" at col. 2, lines 21-64).

However, Macy does not disclose the image data concerning the position of a plurality of fiducial marks on a fiducial plate and data concerning the position of a feature of the object, the image data being acquired such that the image data concerning the position of a plurality of fiducial marks on a fiducial plate and data concerning the position of a feature of the object is obtained simultaneously;

fitting a fiducial grid model to the image data to establish a conversion from coordinates of the plurality of fiducial marks acquired from the image to coordinates of the plurality of fiducial marks on the fiducial plate using a data processing component;

calculating an absolute location of a center of each of the plurality of fiducial marks in the acquired image relative to the fiducial plate in fiducial plate coordinates using the data processing component, the absolute location indicating a distance measurement in fiducial plate coordinates; and

determining a position of a feature of the object in the acquired image and modifying the determined position based on at least one calculated absolute location of the plurality of fiducial marks in the acquired image.

Instead of Macy, Michael discloses the image data concerning the position of a plurality of fiducial marks on a fiducial plate and data concerning the position of a feature of the object, the image data being acquired such that the data concerning the position of a plurality of fiducial marks on a fiducial plate and data concerning the position of a feature of the object is obtained simultaneously (FIG. 6-48, “estimate camera distortion correction for each camera”; equations (1)-(5) and (13)-(39); “The inventor discloses fitting (computing) a function- $x = G_x(u,v) = \sum_{i,j \geq 0}^{i+j \leq n} a_{ij} u^i v^i$ and $y = G_y(u,v) = \sum_{i,j \geq 0}^{i+j \leq n} b_{ij} u^i v^i$ that can a point of a observed coordinate or image coordinate {u,v} can be transform to a model coordinate or a physical space {x,y} at col. 7, line 40 to col. 8, line 25 and col. 12, lines 22 to col. 15, line 40);

calculating an absolute location of a center of each of the plurality of fiducial marks in the acquired image relative to the fiducial plate in fiducial plate coordinates using the data processing component, the absolute location indicating a distance measurement in fiducial plate coordinates (FIG. 9-56, “The inventor discloses that all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map. The distortion correction map has a fitting function, $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij}u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij}u^i v^i$ that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point or a pixel in one coordinate to the other one. Moreover, it well known that a coordinate or a coordinate system does tell the location of a pixel or a point from the center of the coordinate or coordinate system.” at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58); and,

determining a position of a feature of the object in the acquired image and modifying the determined position based on at least one calculated absolute location of the plurality of fiducial marks in the acquired image (FIG. 9-56, “The inventor discloses that all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map. The distortion correction map has a fitting function, $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij}u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij}u^i v^i$ that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point

or a pixel in one coordinate to the other one. Moreover, it well known that a coordinate or a coordinate system does tell the location of a pixel or a point from the center of the coordinate or coordinate system." at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58);

Nonay discloses fitting a fiducial grid model to the image data to establish a conversion from coordinates of the plurality of fiducial marks acquired from the image to coordinates of the plurality of fiducial marks on the fiducial plate using a data processing component (Fig. 1-405 and Fig. 13; "the determined grid points are preferably fitted to polynomials providing the best fit …" at col. 16, lines 44-64).

Macy, Michael and Nonay are combinable because both are related to the field of point transformation.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to add the process of "fitting grid points" of Nonay and Michael's "method of image distortion correction and local-to-global coordinate transformation using pixel and landmark" to Macy's apparatus for correcting geometrical distortions in digital images using a camera.

The suggestion/motivation would have been to "remove optical distortion from digital image … [and] quickly and efficiently correct optical distortion" (Nonay; col. 2, lines 51-58).

k. Regarding claim 30, claim 30 is analogous and corresponds to claim 2. See rejection of claim 2 for further explanation.

l. Regarding claim 32, claim 32 is analogous and corresponds to claim 4. See rejection of claim 4 for further explanation.

m. Regarding claim 33, claim 33 is analogous and corresponds to claim 5. See rejection of claim 5 for further explanation.

n. Regarding claim 34, claim 34 is analogous and corresponds to claim 6. See rejection of claim 6 for further explanation.

o. Regarding claim 36, Michael discloses wherein the object is part of a semiconductor probe card (“semiconductor wafer” at col. 16, line 53).

p. Regarding claim 37, claim 37 is analogous and corresponds to claim 29. See rejection of claim 29 for further explanation.

q. Regarding claim 38, Michael further discloses further comprising: interposing a substantially transparent substrate having a plurality of fiducials formed therein between the imaging apparatus and the object (“semiconductor wafer” at col. 16, line 53).

r. Regarding claim 39, Michael further discloses further comprising: acquiring a succession of images with an imaging apparatus, each of the succession of images including both the object and the plurality of fiducial marks (FIGs. 6 and 9, “The inventor discloses a method of image distortion correction and local-to-global coordinate transformation using pixel and landmark” at col. 16, lines 4-12).

s. Regarding claim 40, Michael further discloses wherein the image data includes object data and fiducial data (FIGs. 6 and 9, “The inventor discloses a method

of image distortion correction and local-to-global coordinate transformation using pixel and landmark" at col. 16, lines 4-12).

8. Claims 3, 18 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macy et al. (US 6,538,691 B1) in view of Michael et al. (US 5,768,443), and further in view of Nonay et al. (US 6,618,494) and Thompson (US 5,020,123).

a. Regarding claim 3, the combination of Macy, Michael and Nonay discloses all the previous claim limitations including said identifying coordinates for each fiducial (Michael; "[T]he landmark feature of the calibration target is used to establish a local origin for the corrected physical coordinate system" at col. 7, lines 14-16) and said calculating an absolute location (Michael; FIG. 9-56, "The inventor discloses that all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map. The distortion correction map has a fitting function, $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij} u^i v^i$ and $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij} u^i v^i$ that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point or a pixel in one coordinate to the other one. Moreover, it well known that a coordinate or a coordinate system does tell the location of a pixel or a point from the center of the coordinate or coordinate system" at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58) of identified acquired image feature centers ("pixels associated with feature points" at col. 16, lines 57-58).

However, the combination does not disclose a selectively iterating process.

Instead of the combination, Thompson, the same field of endeavor of detecting image distortion, discloses selectively iterating process (FIGs. 2-205, 2-206, 2-207, "The invention shows an iterating process that fiducial marking are identified or compared with a predetermined tolerance" at col. 3, line 53 to col. 3, line 64).

The combination and Thompson are combinable because both of them are related to the field of image distortion.

The combination **contains a "base" process of** identifying coordinates for each fiducial as **"the landmark feature of the calibration target being used to establish a local origin for the corrected physical coordinate system"** (Michael; col. 7, lines 14-16) and calculating an absolute location as the step of **"all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map comprising a fitting function,** $x = G_x(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} a_{ij}u^i v^i$ **and** $y = G_y(u,v) = \sum_{i,j\geq 0}^{i+j\leq n} b_{ij}u^i v^i$ **that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point or a pixel in one coordinate to the other one** (Michael; col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58) of identified acquired image feature centers corresponding to the "**pixels associated with feature points"** (Michael; col. 16, lines 57-58), **which the claimed invention can be seen as an "improvement"** in that **selectively iterating the process of the indentifying coordinates of fiducial and calculating the absolute location of the image feature centers** [emphasis added].

Thompson **contains a known technique** of selectively iterating process corresponding to the **“iterating process that fiducial marking are identified or compared with a predetermined tolerance”** (Thompson; FIGs. 2-205, 2-206, 2-207; col. 3, line 53 to col. 3, line 64) [emphasis added].

One of ordinary skilled in the art would have been recognized that applying Thompson’s **known technique** of the selectively iterating process (Thompson; FIGs. 2-205, 2-206, 2-207, “The invention shows an iterating process that fiducial marking are identified or compared with a predetermined tolerance” at col. 3, line 53 to col. 3, line 64) **as applicable to the “base" process** of the combination, which comprises identifying coordinates for each fiducial (Michael; “[T]he landmark feature of the calibration target is used to establish a local origin for the corrected physical coordinate system” at col. 7, lines 14-16) and calculating an absolute location (Michael; FIG. 9-56, “The inventor discloses that all of the pixels or the pixels associated with feature points are corrected for camera distortion using distortion correction map. The distortion correction map has a fitting function, $x = G_x(u,v) = \sum_{i,j \geq 0}^{i+j \leq n} a_{ij} u^i v^i$ and $y = G_y(u,v) = \sum_{i,j \geq 0}^{i+j \leq n} b_{ij} u^i v^i$ that can a point of an observed coordinate or an image coordinate {u,v} can be transformed to a model coordinate or a physical space {x,y}, which is a transformation or a calculation of a point or a pixel in one coordinate to the other one” at col. 7, line 40 to col. 8, line 25, col. 12, lines 22 to col. 15, line 40 and col. 16, lines 54-58) of identified acquired image feature centers (Michael;“pixels associated with feature points” at col. 16, lines 57-58) **would have yielded predictable results of**

selectively iterating process for identifying the coordinates of each fiducial and calculating the absolute location of the image feature center, which **results in an improved process such** as "[providing] [a] robust handling of distortion and noise" (Thompson; col. 6, lines 56-57), "area identification …accurately performed with any number of fiducial markings … [and] realized even in situations in which fiducial markings are missing or are unrecognizable" (Thompson; col. 6, lines 59-63) [emphasis added].

Therefore, it would have been obvious to combine Michael, Nonay and Thompson to obtain the invention specified in claim 3.

b. Regarding claim 18, Claims 18 recites a computer readable medium encoded with data and instructions, said data and said instruction causing an apparatus executing said instructions comprising steps equivalent to claims 3.

The claim is analogous and corresponds to claim 3. See rejection of claim 3 for further explanation.

c. Regarding claim 31, claim 31 is analogous and corresponds to claim 3. See rejection of claim 3 for further explanation.

9. Claims 7 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Macy et al. (US 6,538,691 B1) in view of Michael et al. (US 5,768,443), and further in view of Nonay et al. (US 6,618,494) and Leonard et al. (US 7,034,272 B1).

a. Regarding claim 7, the combination of Macy, Michael and Nonay discloses all the previous claim limitation including imaging apparatus (Macy; "digital camera…" at col. 2, lines 21-22).

However, the combination does not disclose said imaging device comprising a complementary metal-oxide semiconductor device.

Instead of the combination, Leonard, the same field of endeavor of calibration of the data measurements using coordinates, discloses said imaging device comprising a complementary metal-oxide semiconductor device (FIGs. 4-10 and 5-10; “CMOS camera” at col. 4, lines 45-49).

The combination and Leonard are combinable because both of them are related to the field of calibration of the data measurements using coordinates.

The combination contains an imaging device **which differed from the claimed device by the substitution of the digital camera** (Macy; col. 2, lines 21-22) **with complementary metal-oxide semiconductor device** [emphasis added]. Leonard discloses **substituted device as a CMOS camera** (FIGs. 4-10 and 5-10; “CMOS camera” at col. 4, lines 45-49), and **their functions were known in the art** to acquire an image of an object [emphasis added].

One of ordinary skilled in the art could have been substituted one known element for another, which is substituting the CMOS camera of Leonard (FIGs. 4-10 and 5-10; “CMOS camera” at col. 4, lines 45-49) **for the imaging device being a digital camera** of Macy (col. 2, lines 20-21), and **the results of the substitution would have been predictable resulting in** acquiring image with less power or power

consumption, the capability of accessing the region of interest of the image by integrating easily with other components as it is well-known [emphasis added].

Therefore, it would have been obvious to combine Macy, Michael, Nonay and Leonard to obtain the invention specified in claim 7.

b. Regarding claim 35, claim 35 is analogous and corresponds to claim 7. See rejection of claim 7 for further explanation.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN LEE whose telephone number is (571)272-9554. The examiner can normally be reached on Monday - Friday (Alt.) 7:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Samir Ahmed can be reached on (571) 272-7413. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JOHN W. LEE/
Primary Examiner, Art Unit 2624